however, that women stand the injections remarkably well, provided that a sufficiently long needle is used; and I always keep some on hand for the purpose.

DR. W. B. TRIMBLE, New York City: I thought Dr. Gottheil advocated the use of the injection treatment, above all others, and as a routine measure in every case, I disagree with this view, as I do not think it the method of election in every case of syphilis. If it were necessary to select one form of treatment to the exclusion of all others, I do not think I would hesitate in choosing the inunction plan. The soluble preparations that I usually employ are the succinimid and the benzoate.

DR. ALEXANDER S. WOLF, St. Louis: It appears to be a comfortable and convenient arrangement for both physician and patient to have a nurse or an attendant rub the blue ointment into the skin of the patient, but such a luxury can be had only by the wealthy. Such a procedure, however, is not rational, and for the rich as the poor we must insist on self-inunction treatment as the one which under necessary instructions for the patient—and in this regard our young generation of physicians must be instructed thoroughly in the school—will alone be of benefit. While the poor patient will abide by our directions without any further deliberation, the well-to-do patient who has heard about inunctions carried out by a nurse, must be enlightened as to the necessity and rationality of self-rubbing. You need only to impress on his mind that it is better for his health and the result of the treatment, if a good deal of the ointment will remain in the skin of his own hand than in the leather of the nurse's glove.

DR. LOUIS E. SCHMIDT, Chicago: In discussing this subject of the comparative value of the different methods of treating syphilis, we should do so in connection with our present knowledge of serum reaction. I have had about 60 cases of syphilis in which practically the same line of treatment has been carried out, mostly by the injection method with gray oil. I want to bring out the result of the Wassermann test in these cases. In some cases, the test was negative after only eighteen months of treatment, while others gave a marked reaction after four or five years of treatment. I have had patients under my observation and treatment for three, four and five years, and still the test is positive. What am I to do in such cases? Am I to continue vigorous treatment for ten years or more if the reaction continues positive, and in those cases that give a negative reaction after only eighteen months of treatment, can treatment be discontinued or pursued less vigorously? I believe the test should be repeated every six months, and if it remains negative, continue to leave the patient untreated. However, as the test is still so new, I am inclined to believe that a mild mixed treatment should be kept up.

DR. E. C. HAY, Hot Springs, Ark.: One point I would like to emphasize is that the insoluble injections should not be repeated too rapidly, in order to avoid the possibility of mercurial stasis, as alarming or even fatal symptoms may develop if not detected in time from a sudden absorption of a large quantity of mercury. This condition can generally be recognized by keeping a close watch over the urine for the elimination of mercury. In regard to the inunction method, I am not in favor of having the patients rub each other. In my experience, it has been better to employ a trained rubber for that purpose, one who can do the work more thoroughly than the patients could do it for themselves.

Municipal Playgrounds.—Playgrounds, places for the youngsters to play and develop their young lungs by exercise, are becoming one of the big items in the budget of a city. Chicago, for instance, has spent eleven million dollars on a system of playgrounds and recreation centers, containing outdoor and indoor gymnasiums, swimming pools, wading pools, shower baths, swings, slides, ball fields and rooms for lectures and social meetings. New standards have been set up in neighborhoods that knew them not, and the benefit is accounted so great that the cost of $2.00 per $1,000 assessed valuation of the property benefited is regarded as an ideal investment of the city's income.—*Hygiene and Physical Education.*

INOCULATIONS OF POLYVALENT STAPHYLOCOCCIC SUSPENSIONS IN STAPHYLOCOCCIC INFECTIONS OF THE SKIN *

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Now that time has allowed the smoke of enthusiasm to clear away, we should be able to take an accurate reckoning of the value of artificial immunization of patients with staphylococcic infections of the skin.

Two years ago, before this Section, I reported a series of staphylococcic infections of the skin treated by bacterial inoculations. The conclusions at that time were not unlike those of other investigators along this line of treatment. Autogenous suspensions were found more efficient than monovalent stock suspensions, and inoculations guided by opsonic estimations were found more effectual than those that were not so guided.

Owing to the time consumed in isolating the invading organism and standardizing the suspensions, and the difficulties in making opsonic estimations, opsonic therapy has evoked criticism. The purport of this paper, then, is to discuss the simplifications which assist in placing opsonic therapy on a practical basis. So much progress has been made over our previous knowledge that we are now able to obtain as good results, in selected cases, with polyvalent stock suspensions as with the autogenous. Laborious opsonic estimations are unnecessary as a guide to reinoculations. Experience has proved to me that inoculations of a polyvalent stock suspension, made at intervals indicated by clinical symptoms, produce as good results as when controlled by opsonic indices.

For some time bacteriologists have noted minute differences between cultures of the same species obtained from different sources, although the morphology of the organism shows the typical form on ordinary culture media. A suspension, then, made from a number of strains of the same organism, obtained from various patients suffering from the same disease, is the stock suspension employed. The object of this is to embody the varying properties of a number of strains.

Polyvalent suspensions of staphylococcic strains have been and are being used by many investigators, but, to my knowledge, no large number of strains obtained from the same disease has been employed. My polyvalent suspensions have contained no less than twenty different strains, which have been increased to forty by mixing two or more suspensions. These strains are kept growing slowly, at room temperature, in darkness, and are transferred as infrequently as possible to keep them alive. By this method the virulence of the strain is probably less lowered than might be the case if the strain was frequently transferred. New strains are occasionally being added which give varying ages to the suspensions as well as varying virulence. Such a suspension is as easily prepared and standardized as an autogenous one, and retains its activity, as far as can be determined clinically, for at least six months. Here, then, we have a stock suspension which is ever ready and can be used when the patient first appears, with a saving of days of time over the method of preparing autogenous bacterial suspensions.

* Read in the Section on Dermatology of the American Medical Association, at the Sixtieth Annual Session, held at Atlantic City, June, 1909.

From comparisons of opsonic indices, in a large number of like infections taken in the laboratory prior to using stock suspensions, we are given further valuable knowledge, not only in estimating the size of the dose to administer, but when to reinoculate. The dose of the first inoculation should be of sufficient size to cause only a slight languor, which means a four to eight hours' negative phase after the inoculation. From 100 to 150 millions is the appropriate initial dose, varying as clinical indications denote. In the immunization of animals toward a given toxin, the dose given must be of gradually increasing strength, to a certain standard, the frequency and size of the dose to be governed by the temperature of the animal and other clinical manifestations, and later by potency tests. The same is true of human artificial immunization with bacterial suspension, the doses varying in size and intervals. Within six times twenty-four hours after the initial dose, the patient's resistance, as proved by opsonic estimations, will have dropped after its positive phase to within nearly what it was when the first dose was administered. Then the second dose should be given, which should be from 200 to 250 millions, and the third from 300 to 400 millions. It is seldom necessary to increase the dose to more than 600 millions. The spacing of the first three doses six days apart (six times twenty-four hours) is of importance, and further doses should be given as clinical manifestations indicate. One of the first indications of a lowered resistance and recurrence is a tenderness in the already healed scar, as in boils.

The rebellious types of the following diseases are those to be considered: furunculosis and carbuncle, impetigo contagiosa, sycosis staphylogenes, and pustular acne. In selecting from this group of diseases, we are considering only the rebellious ones, thereby excluding the possibility of spontaneous recovery, consequently putting this therapeutic measure to the crucial test.

What is more annoying than the persistently recurring lesion in what is termed the chronic "boiler," or the sycosis condition which presents itself with a history of years of existence? The patient who returns almost annually, usually during February or March, with a multiple furunculosis has a lowered resistance to staphylococcic infection. We have heretofore reasoned that the condition of such a patient was below normal or he would not be afflicted with such infections. Our medical advice has been governed by such suppositions, and tonics, diet and specific medications, the action of which has never been clearly known, have been prescribed. We had no accurate means of determining the patient's resistance to the infection, or whether our treatment raised his resistance, until Sir A. E. Wright published his most ingenious technic, by the application of which we are able artificially to immunize patients by bacterial inoculations. The further proof that the patient's resistance is not only low during such infection but in the process of artificial immunization, lies in the fact that the patient's resistance shows a prompt rise, as indicated by laboratory indices which are confirmed clinically. The lowered resistance of the patient may not be due wholly to deficiencies in the blood substances or lack of opsonins, but partially to abnormal development or lack of tonicity of the skin structure. General lowered resistance to the staphylococcic family, due to constitutional diseases, will not be considered.

The predisposing qualities of such skin structures to infection must be considered and corrected, or the raising of the patient's resistance will often fail to cure.

Many abnormal conditions in the skin structure predispose to a more easy access of this type of infection into the deeper structures of the skin; for example, the thin, oily skin with the gaping sebaceous ducts not only allows easy entrance of the organisms, but such a skin supplies them with an abundance of food in the excess sebaceous material. The walling-off of such an infected area is Nature's means of preventing systemic infection. This process in the infection of the carbuncle or boil is so thorough that the infected area must necrose in order to rid itself of the infection. This process of defense not only practically stops leucocytosis, but prevents the toxins from entering the blood stream, except in limited quantity, which results in the formation of protective substances and only partial immunization. Protective substances are not generated in sufficient quantities to prevent reinoculation; hence the continuance of the infection. The toxins of such an infection must enter the blood stream in safe quantities in order that protective substances may be elaborated to the degree of immunization. While the natural forces of resistance are spending their best efforts in walling off the infection, unable to produce immunizing substances from lack of specific toxic material, our assistance in artificial immunization is of unquestionable value at this time, which is demonstrated clinically.

One can readily see the utter uselessness of attempting to raise the patient's resistance to a given organism when the protective substances or leucocytes are unable to reach the organisms because of the stagnation of circulation in the area of infection. The absolute necessity for other therapeutic means here presents itself to the more successful management and cure of this type of infection. The drawing off of such stagnant fluid by excision and evacuation of the furuncle or carbuncle and the application of heat, or Bier's hyperemia, cupping to encourage bleeding, is advisable. Such means not only draw off the stagnant infected blood and lymph, but produce increased circulation of blood and lymph through the infected area. At this time the assistance brought about by a general raising of the blood resistance may be effected by bacterial inoculations.

In no other staphylococcic infections of the skin have there been such uniformly gratifying results as in multiple furunculosis and carbuncles. This method of treatment has a scientific basis and is rapidly replacing the older methods. It has been possible, in a number of instances, to compare the efficiency of the polyvalent suspensions with that of autogenous suspensions, observations being assisted by patients, who were physicians. Rarely has a new lesion developed after the first inoculation has been administered. A partially developed lesion can often be dwarfed, and within forty-eight hours all pain and discomfort to the patient will have subsided.

In order to ascertain just what percentage of the cases were recurrent, I recently reviewed the histories for the last two years of patients given polyvalent suspensions: I was surprised to find that there had been only three recurrences out of twenty-eight cases of multiple furunculosis. It was also of interest to note that the three patients who suffered recurrences were those to whom no more than two inoculations had been administered. Undoubtedly, only partial immunization had been effected. Previous to this treatment, at least 90 per cent. of these cases had been the chronic recurrent type, and for a period of two years there have been no recurrences of cases who were given four or more inoculations.

Comparing our knowledge of immunization brought about in other infectious diseases, at least four inoculations seem necessary to insure against recurrence.

It is important to instruct the patients when inoculations are given to take precautions against fatigue. The negative phase will then be less pronounced, and the positive phase prolonged. The beneficial effects of inoculations can be completely destroyed by prolonging the negative phase by fatigue, alcoholism, menstruation, or any intemperate indulgence, and new lesions may develop.

CONCLUSIONS

Polyvalent staphylococcic stock suspensions administered in appropriate doses have a decided therapeutic value in a group of localized, rebellious infections of the skin. Their administration is practically without danger, bringing about prompt cessation of the active infection and immunizing the patient against a recurrence of the infection for a more or less prolonged interval.

Clinical observations act as guides to the time for reinoculation and the size of dose to be administered.

The appropriate standards for size and frequency of doses have been previously established from opsonic estimations on laboratory patients with like infections, and are not necessary for each specific case.

Failure to immunize the patient artificially may be due to an abnormal condition of the skin, non-specific bacterial suspensions, or incorrect dosage.

Much time is saved in the use of stock suspensions by the elimination of opsonic indices and by the assistance derived from other therapeutic measures.

Less suffering, less deformity, less danger of systemic infection, and less liability to recurrence are the advantages derived from the use of bacterial suspensions as a therapeutic agent.

I am especially indebted, and wish to express my thanks to L. T. Clark, B.S., of the Research Laboratory of Parke, Davis & Co., for bacteriologic assistance and suggestions.

Washington Arcade.

ABSTRACT OF DISCUSSION

DR. M. L. HEIDINGSFELD, Cincinnati: I have been more than favorably impressed with the results which I have secured from vaccine treatment in furunculosis, acne, sycosis and various forms of dermatologic affections complicated with secondary impetiginous infection. I have been induced to take up this form of treatment, largely by the favorable results which I have obtained in genitourinary work with gonococcus vaccine. I have had no experience with polyvalent stock vaccine, as my work has been entirely limited to monovalent vaccine as supplied by various wholesale drug houses and with autogenous preparations. I believe that the vaccine treatment will have a future field of great value and usefulness in a host of dermatologic affections of infectious nature.

DR. JOHN A. FORDYCE, New York City: I would like to put on record two cases of infection of the skin in which the autogenous vaccines were used with good results. One was a case of vegetating dermatitis, with abscesses, in which the *Staphylococcus albus* was found. An autogenous vaccine was used for a number of months, and the patient improved remarkably, many of the abscesses disappearing. The patient gained eighteen pounds in weight, but finally reached the stage where improvement ceased. The second case was one of general infection with the *Staphylococcus aureus*. There were vegetations of the scalp and lower extremities, and from these lesions cultures of the organism were made. An autogenous vaccine was used, and the patient improved very much.

DR. A. RAVOGLI, Cincinnati: I had a case of sycosis folliculitis, which proved extremely obstinate, and in which I resorted to injections of vaccines of the *Staphylococcus albus* and *S. aureus*. The injection was followed by a very marked reaction. The patient developed a temperature of 102.5 F., which lasted about twelve hours, perhaps longer. Following this, the eruption began to improve, the pustules almost drying up. Then there was a recurrence of the pustular lesions and a second injection was given. In spite of the fact that the dose was increased, the reaction was not so marked as in the first instance. Following this the pustules again partly dried up, and the patient left the hospital, but returned in a worse condition than before. Further injections were tried, but as they did not prove beneficial, they were stopped, and external remedies were substituted.

DR. ALFRED POTTER, Brooklyn: We have had some experience with the vaccines in Dr. Winfield's service at the King's County Hospital in Brooklyn in the treatment of pustular and pemphigoid conditions. In one case of bullous eruption, of the hemorrhagic type in which we isolated a bacillus of the colon type, the patient was apparently going to die, but recovery took place under the vaccine treatment.

DR. HENRY H. HAZEN, Washington, D.C.: In the dermatologic department of the Johns Hopkins Hospital we have used vaccine treatment in about twelve cases a week. In one case, that of a student with an eruption of the nose resembling pustular acne, we first tried the staphylococcus vaccine without effect, then a vaccine made from the acne bacillus also without effect. A culture was made, showing an unidentified bacillus, and under the use of a vaccine prepared from this rapid improvement resulted. I believe that one reason why we frequently have poor results from a stock vaccine is that the eruption is due to a different organism. I feel that if stock vaccines do not work we should make a culture from the lesion and prepare our vaccine from this.

Now, a word as to the use of Bier's hyperemia in conjunction with the vaccine treatment. The reason for using a vaccine is as follows: The lesion is so localized that the toxins from it do not enter the general circulation sufficiently to stimulate the body cells to the production of the necessary amount of antitoxin. Vaccine, however, enters the general circulation and causes the production of antitoxin. Now, if the necessary amount of toxin can not get to the body, it is also probable that the necessary amount of antitoxin can not get to the lesion, but a cup will bring much more serum to the part, hence more antitoxin.

DR. H. R. VARNEY, Detroit: In testing the clinical value of this suspension, I confined its application to the treatment of furunculosis in order to determine, so far as possible, its efficiency. My experience with the use of the stock vaccine in acne has not been uniformly good. The infection is too often secondary to an abnormal condition of the skin, and while one may get temporary improvement, recurrences are most likely to take place. The most important question in connection with this discussion is: Can we simplify our technics so as to use a stock suspension? In the report which I made two years ago I stated that autogenous vaccines were more efficacious than the stock vaccine. In one of my cases (that of a physician who has long been a sufferer from boils) I had a special autogenous vaccine made. This was tried, with several recurrences, but the patient had not further recurrence after three inoculations of the *Staphylococcus aureus* suspension composed of 23 strains. I am strongly in favor of aiding the vaccine treatment by increasing the blood supply to the parts by the Bier hyperemic cupping method.

The age of the vaccine is a very difficult point to determine. The fact that one patient responds as readily to a vaccine that is six months old as another does to a freshly made vaccine does not throw much light on the value of the age of the vaccine, and *vice versa*.

Traveling Cooking Schools.—In Germany, to teach peasants how to cook cheaply and well, traveling cooking schools are sent about. When we secure a national health department this can be looked forward to in this country—as well as traveling schools of instruction on many other subjects related to the health of the people.